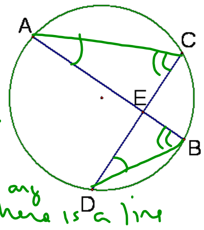
10.6 Find Segment Lengths in Circles

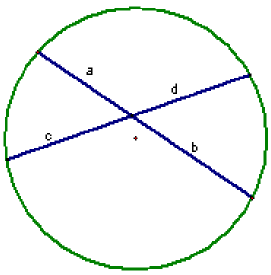
Given: picture
Prove: AExEB = CExDE



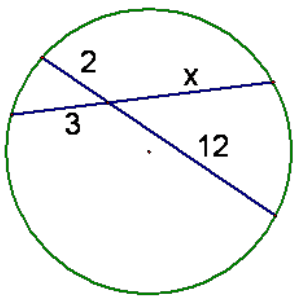
Statements	Reasons
1) ~	1) Given
2) Draw $\overline{AC}$ + $\overline{BD}$	2) Through any 2 pts there is a line
3) $\angle A \cong \angle D$, $\angle C \cong \angle B$	3) If 2 inscribed ∠s intercept the same arc, they are ≅
4) $\triangle AEC \sim \triangle DEB$	4) AA~
5) $\frac{AE}{DE} = \frac{CE}{BE}$	5) Corr sides of ~△s are proport.
6) $AE \cdot EB = CE \cdot DE$	6) Cross Mult.

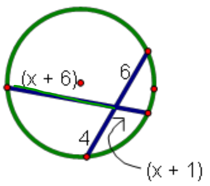
Theorem 10.14-Segments of Chords Theorem--If 2 chords intersect in a circle, then the products of the lengths of the segments of the chords are equal.

$a \cdot b = c \cdot d$



$3x = 2 \cdot 12$
$x = 8$





$(x+6)(x+1) = 6 \cdot 4$

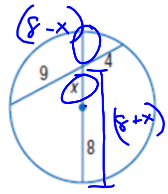
$x^2 + 7x + 6 = 24$

$x^2 + 7x - 18 = 0$

$(x+9)(x-2)$

$x = -9$ $\quad$ $x = 2$

22.



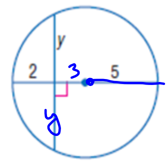
$(8-x)(8+x) = 9 \cdot 4$

$64 - x^2 = 36$

$28 = x^2$

$\pm 2\sqrt{7} = x$ $\quad$ $x = 2\sqrt{7}$

23.



$y^2 = 2 \cdot 8$

$y^2 = 16$

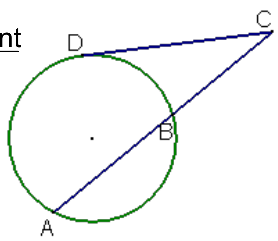
$y = \pm 4$

$y = 4$

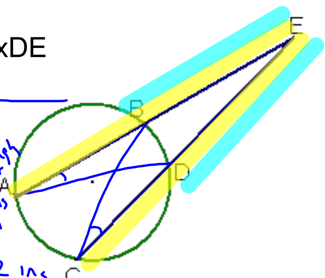
$\overline{AC}$ Secant segment--is a segment that contains a chord of a circle and has exactly one endpoint outside the circle.

External segment $\overline{CB}$

Tangent segment $\overline{CD}$



Given: picture
Prove: AExBE = CExDE

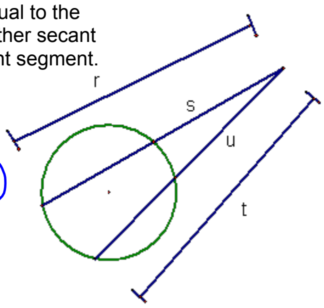


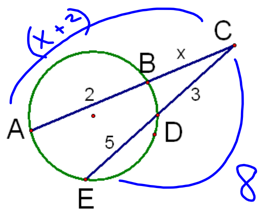
Statements	Reasons
① ~~	① Given
② Draw $\overline{AD}$ & $\overline{BC}$	② Through any 2 pts there exists one line
③ $\angle A \cong \angle C$	③ If 2 inscribed ∠s intercept the same arc, then they are ≅
④ $\angle E \cong \angle E$	④ Refl.
⑤ $\triangle ADE \sim \triangle CBE$	⑤ AA~
⑥ $\frac{AE}{CE} = \frac{DE}{BE}$	⑥ Corr sides of ~△s are prop.
⑦ $AE \cdot BE = CE \cdot DE$	⑦ Cross Mult.

Theorem 10.15-Segments of Secants Theorem--If two secants share the same exterior point, then the product of the lengths of one secant segment and its external secant segment is equal to the product of the lengths of the other secant segment and its external secant segment.

$r \cdot s = t \cdot u$

(whole)(ext) = (whole)(ext)





$x(x+2) = 8 \cdot 3$

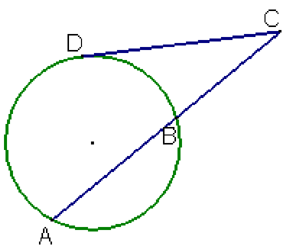
$x^2 + 2x - 24 = 0$

$(x+6)(x-4)$

$x = -6$ $x = 4$

Theorem 10.16-Segments of Secants and Tangents Theorem--
If a tangent segment and a secant segment share an exterior point, then the (length of the tangent segment)² = the product of the lengths of the secant segment and its external secant segment

$DC^2 = AC \cdot BC$

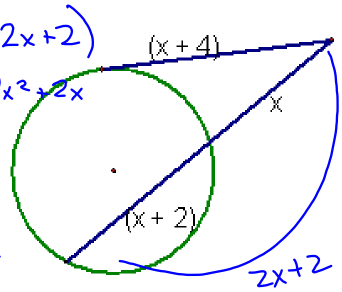


$(x+4)^2 = x(2x+2)$

$x^2 + 8x + 16 = 2x^2 + 2x$

$(x-8)(x+2) = 0$

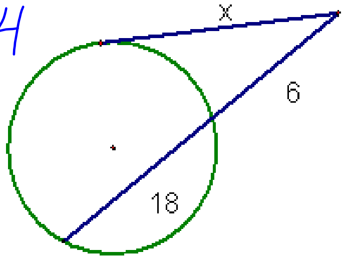
$x = 8$ $x = -2$



$x^2 = 6 \cdot 24$

144

12



Homework:

p. 692-694 #s 3-10, 16, 18, 26